2.2.6 Air Quality

2.2.6.1 Regulatory Setting

The Clean Air Act (CAA) of 1970, as amended in 1990, is the federal law that governs air quality. Its counterpart in California is the California Clean Air Act (CCAA) of 1988. These laws set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). Standards have been established for six criteria pollutants that have been linked to potential health concerns; the criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), lead, and sulfur dioxide (SO_2).

The California Clean Air Act, established in 1988, provides a framework for air quality planning and other actions to meet the health-based State Ambient Air Quality Standards. Air quality standards established under the California Clean Air Act are more stringent than those set through the Federal Clean Air Act. Emission reductions from mobile sources (such as automobiles themselves) are the responsibility of the California Air Resources Board, while emission reductions from stationary sources and some uses of mobile sources are the responsibility of the air quality management and air pollution control districts. Under the 1990 CAA Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve federal actions to support programs or projects that are not first found to conform to the State Implementation Plan (SIP) for achieving the goals of the CAA requirements. Conformity with the CAA takes place on two levels: (1) at the regional level, and (2) at the project level. The proposed project must conform at both levels to be approved.

Regional level conformity in California is concerned with how well the region is meeting the standards set for CO, NO_2, O_3, and PM. At the regional level, Regional Transportation Plans (RTP) are developed that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the RTP, an air quality model is run to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the CAA are met. If the conformity analysis is successful, the regional planning organization, such as the Southern California Association of Governments (SCAG) for Southern California, including Orange County, and the appropriate federal agencies, such as the Federal Highway Administration (FHWA), make the determination that the RTP is in conformity with the SIP for achieving the goals of the CAA. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP, the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project level also requires hot spot analysis if an area is “nonattainment” or “maintenance” for CO and/or PM. A region is a nonattainment area if one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called maintenance areas. Hot spot analysis is essentially the same, for technical purposes, as CO or PM analysis performed for NEPA purposes. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the CO standard to be violated, and in “nonattainment” areas the project must not cause any increase in the number and severity of violations. If a known CO or PM violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation as well.

2.2.6.2 Affected Environment

Analysis of the potential air quality impacts of the proposed SR-74 Lower Ortega Widening project is based on the approved Air Quality Analysis (LSA, November 2008) and the current air quality guidelines as of August 2009. The Air Quality Analysis is on file and available for review at the California Department of Transportation (Department) District 12 offices.

The California Air Resources Board (ARB) coordinates and oversees the State and federal air pollution control programs in California. The ARB maintains air quality monitoring stations throughout California in conjunction with local air districts. Data collected at these stations are used by the ARB to classify air basins as attainment or nonattainment with respect to each pollutant and to monitor progress in attaining the defined NAAQS. The ARB has divided the State into 15 air basins. Substantial authority for air quality control within the air basins has been given to local air districts that regulate stationary-source emissions and develop local attainment plans.

Climate

The project site is located in Orange County, an area within the South Coast Air Basin (Basin), which includes Orange County and the nondesert parts of Los Angeles, Riverside, and San Bernardino Counties. Air quality regulation in the Basin is administered by the South Coast Air Quality Management District (SCAQMD), a regional agency created for the Basin.

The Basin climate is determined by its terrain and geographical location. The Basin is a coastal plain with connecting broad valleys and low hills. The Pacific Ocean forms the southwestern boundary, and high mountains surround the rest of the Basin. The region lies in the semipermanent high pressure zone of the eastern Pacific Ocean. The resulting climate is mild and tempered by cool ocean breezes. This climatological pattern is rarely interrupted; however, periods of extremely hot weather, winter storms, and Santa Ana wind conditions do occur.

The annual average temperature (in degrees Fahrenheit [°F]) varies little throughout the Basin, ranging from the low to middle 60s. With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The San Juan Canyon Station[1] is the closest climatological station to the site that monitors temperature. The annual average maximum temperature recorded at this station is 78.8°F, and the annual average minimum is 47.6°F. December is typically the coldest month in this area of the Basin.

The majority of annual rainfall in the Basin occurs between November and April. Summer rainfall is minimal and generally limited to scattered thundershowers in coastal regions and slightly heavier showers in the eastern portion of the Basin along the coastal side of the mountains. The climatological station closest to the site that monitors precipitation is the San Juan Canyon Station. Average rainfall measured at this station varied from 4.65 inches in February to 0.33 inch or less between May and October, with an average annual total of 12.84 inches. Patterns in monthly and yearly rainfall totals are unpredictable due to fluctuations in the weather.

The Basin experiences a persistent temperature inversion (increasing temperature with increasing altitude) as a result of the Pacific High. This inversion limits the vertical dispersion of air contaminants, holding them relatively near the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the

1 Western Regional Climatic Center. 2009. http://www. wrcc.dri.edu (accessed August 13, 2009).

inversion layer finally breaks, allowing vertical mixing with the lower layer. Inversion layers are important in determining O_3 formation. O_3 and its precursors will mix and react to produce higher concentrations under an inversion. The inversion will also simultaneously trap and hold directly emitted pollutants such as CO. PM_{10} (particulate matter less than 10 microns in size) is both directly emitted and created indirectly in the atmosphere as a result of chemical reactions. Concentration levels are directly related to inversion layers due to the limitation of mixing space.

Air Pollution Constituents

Pursuant to the CAA, the EPA established NAAQS for six major pollutants, termed criteria pollutants. Criteria pollutants are defined as those pollutants for which the federal and state governments have established ambient air quality standards (AAQS), or criteria, for outdoor concentrations in order to protect public health. The NAAQS are two-tiered: primary, to protect public health, and secondary, to prevent degradation to the environment (e.g., impairment of visibility, damage to vegetation and property).

The six criteria pollutants are O_3, CO, PM, NO_2, SO_2, and lead. PM includes particulate matter less than 2.5 microns in size ($PM_{2.5}$) and particulate matter less than 10 microns in size (PM_{10}). In April 2003, the EPA was cleared by the White House Office of Management and Budget (OMB) to implement the 8-hour ground-level O_3 standard. ARB provided the EPA with California's recommendations for 8-hour O_3 area designations on July 15, 2003. The recommendations and supporting data were an update to a report submitted to the EPA in July 2000. On December 3, 2003, the EPA published its proposed designations. EPA's proposal differs from the State's recommendations, primarily on the appropriate boundaries for several nonattainment areas. ARB responded to the EPA's proposal on February 4, 2004. On April 15, 2004, EPA announced the new nonattainment areas for the 8-hour O_3 standard. The designation and classification became effective on June 15, 2004. The Transportation Conformity requirement became effective on June 15, 2005.

The EPA proposed a $PM_{2.5}$ implementation rule in September 2003 and made final designations in December 2004. The $PM_{2.5}$ standard complements existing NAAQS and State AAQS that target the full range of inhalable PM_{10}.

In addition to the six criteria pollutants regulated by EPA, California also has set standards for visibility reducing particles, sulfates, hydrogen sulfide and vinyl chloride.

Local Air Quality

The project site is located within SCAQMD jurisdiction. The SCAQMD maintains ambient air quality monitoring stations throughout the Basin. Figure 2.2.6-1 shows the locations of the air quality monitoring station in the Basin. The air quality monitoring stations closest to the site are the Mission Viejo-26081 Via Pera Station and the Costa Mesa-Mesa Verde Drive Station. Their air quality trends are representative of the ambient air quality in the project area. Pollutants monitored at the Mission Viejo-Via Pera Station are CO, O_3, $PM_{2.5}$, and PM_{10}. Pollutants monitored at the Costa Mesa station are NO_2 and SO_2.

Air quality trends identified from data collected at both air quality monitoring stations between 2006 and 2008 are listed in Table 2.2.6-1 and are discussed below. The ambient air quality data in Table 2.2.6-1 show that NO_2, $PM_{2.5,}$ and CO levels are below the relevant State and federal standards. The State one-hour O_3 standard was exceeded 5 to 13 times per year in the last 3 years. The federal 8-hour O_3 standard was exceeded 5 to 15 times per year in the last 3 years. The State 24-hour PM_{10} standard was exceeded once in 2006 and three times in 2007 but has not exceeded the federal 24-hour standard since 1999.

This page intentionally left blank

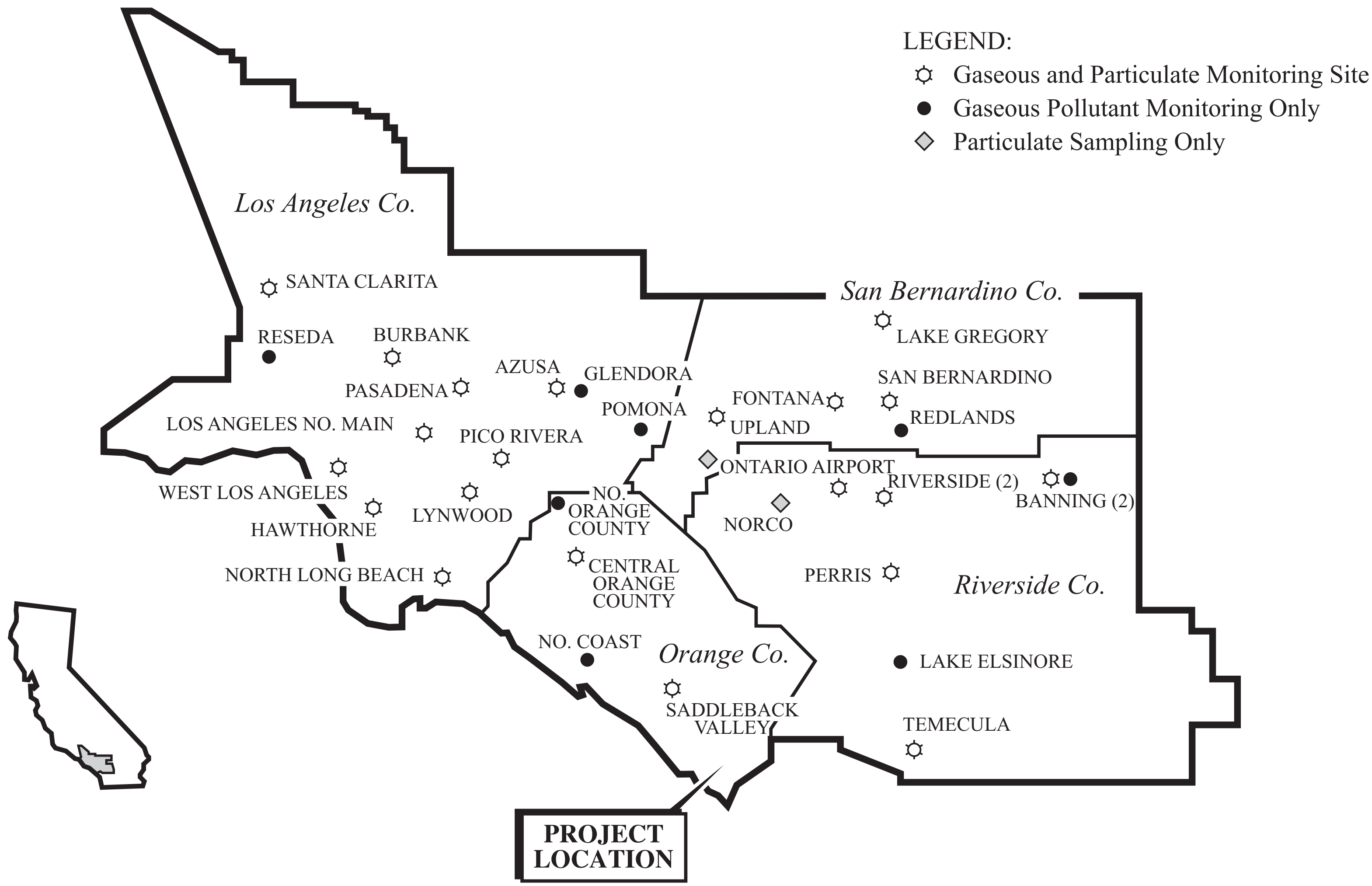


FIGURE 2.2.6-1

N

Lower SR-74 Widening Project

Locations of Air Quality Monitoring Stations in the Basin

12-ORA-74 PM 1.0/1.9
EA No. 086920

I:\CDT08020A\G\Scaqmd.cdr (11/17/09)

This page intentionally left blank

Regional Air Quality Conformity

The proposed SR-74 Lower Ortega Widening project is fully funded and is included in the 2008 RTP, which was found to conform by SCAG on May 8, 2008, and FHWA and FTA adopted the air quality conformity finding on June 5, 2008. The project is also included in the SCAG financially constrained 2008 RTIP Including Amendments 1–4, 7, and 10, Project ID: ORA120507. Description: "Widen Route 74 from 2 to 4 lanes (in San Juan Capistrano from Calle Entradero to City/County Line. Widen from 2 to 4 lanes)." The SCAG 2008 RTIP was found to conform by FHWA and FTA on November 17, 2008. The design concept and scope of the proposed project are consistent with the project description in the 2008 RTP, the 2008 RTIP, and the assumptions in the SCAG regional emissions analysis.

Project-Level Conformity

Pursuant to the federal CAA of 1970, the EPA established NAAQS for several major pollutants, termed "criteria" pollutants. The six criteria pollutants are: O_3, CO, PM, NO_2, SO_2, and lead. PM includes $PM_{2.5}$ and PM_{10}. These pollutants are referred to as criteria pollutants because numerical criteria have been established for each pollutant. In addition, CARB has implemented ambient air quality standards pursuant to the California Clean Air Act. Table 2.2.6-2 identifies the federal and State standards of these pollutants.

Air quality monitoring stations are maintained by the local air districts and state air quality regulating agencies. Data collected at permanent monitoring stations are used by the EPA to identify regions as attainment or nonattainment, depending on whether the regions met the requirements stated in the primary NAAQS. Nonattainment areas have additional restrictions required by the EPA. In addition, different classifications of attainment, such as marginal, moderate, serious, severe, and extreme, are used to classify each air basin on a pollutant-by-pollutant basis. The classifications are used as a foundation to create air quality management strategies to improve air quality and comply with the NAAQS. The Basin's attainment status for each of the criteria pollutants is listed in Table 2.2.6-3. The basin is in nonattainment for ozone (both 1 hour and 8 hour for the state and federal standard), PM 2.5 (both state and federal) and PM 10 (both state and federal).

Table 2.2.6-1 Ambient Air Quality Standards at the Mission Viejo and Costa Mesa Air Monitoring Stations

Pollutant		2006	2007	2008
CO				
Max 1-hr concentration (ppm)		1.9	2.9	1.5
No. days exceeded: State	> 20 ppm/1-hr	0	0	0
No. days exceeded: Federal	> 35 ppm/1-hr	0	0	0
Max 8-hr concentration (ppm)		1.6	2.2	1.1
No. days exceeded: State	> 9.1 ppm/8-hr	0	0	0
No. days exceeded: Federal	> 9.5 ppm/8-hr	0	0	0
O_3				
Max 1-hr concentration (ppm)		0.123	0.108	0.118
No. days exceeded: State	> 0.09 ppm/1-hr	13	5	9
O_3[1]				
Max 8-hr concentration (ppm)		0.105	0.09	0.104
No. days exceeded: State	> 0.07 ppm/8-hr	23	10	25
No. days exceeded: Federal	> 0.08 ppm/8-hr	12	5	15
PM_{10}				
Max 24-hr concentration (ppm)		57	74	42
No. days exceeded: State	> 50 $\mu g/m^3$	1	3	0
No. days exceeded: Federal	> 150 $\mu g/m^3$	0	0	0
$PM_{2.5}$				
Max 24-hr concentration (ppm)		46.9	46.8	31.9
No. days exceeded: Federal	> 35 $\mu g/m^3$	1	2	0
NO_2				
Max 1-hr concentration (ppm):		0.101	0.074	0.081
No. days exceeded: State	> 0.25 ppm/1-hr	0	0	0
Annual avg. concentration: Federal		0.015	0.013	0.013
Exceeded?	0.053 ppm annual avg.	No	No	No

Source: EPA and ARB 2009.

[1] The exceedances of the federal O_3 standard are based on the old 0.080 ppm standard. In 2008, the EPA revised the standard to 0.075 ppm.

ARB = California Air Resources Board
CO = carbon monoxide
EPA = United States Environmental Protection Agency
hr = hour
NO_2 = Nitrogen Dioxide
O_3 = ozone
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
PM_{10} = particulate matter less than 10 microns, but greater than 2.5 microns in diameter
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter

Table 2.2.6-2 Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]		Federal Standards[2]		
		Concentration[3]	Method[4]	Primary[2,5]	Secondary[3,6]	Method[7]
Ozone (O_3)	1-Hour	0.09 ppm (180 μg/m^3)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 μg/m^3)		0.075 ppm (147 μg/m^3)		
Respirable Particulate Matter (PM_{10})	24-Hour	50 μg/m^3	Gravimetric or Beta Attenuation	150 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 μg/m^3		–		
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	No Separate State Standard		35 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 μg/m^3	Gravimetric or Beta Attenuation	15 μg/m^3		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	Nondispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Nondispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8-Hour (Lake Taho e)	6 ppm (7 mg/m^3)		–		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 μg/m^3)	Gas Phase Chemiluminesce nce	0.053 ppm (100 μg/m^3)	Same as Primary Standard	Gas Phase Chemiluminesc ence
	1-Hour	0.18 ppm (339μg/m^3)		–		
Lead[9]	30-day average	1.5 μg/m^3	Atomic Absorption	–	–	High-Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 μg/m^3	Same as Primary Standard	
	Rolling 3-month Average	–		0.15 μg/m^3		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	Ultraviolet Fluorescence	0.030 ppm (80 μg/m^3)	–	Spectrophotom etry (Pararosaniline Method)
	24-Hour	0.04 ppm (105 μg/m^3)		0.14 ppm (365 μg/m^3)	–	
	3-Hour	–		–	0.5 ppm (1300 μg/m^3)	
	1-Hour	0.25 ppm (655 μg/m^3)		–	–	
Visibility-Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of 10 miles or more (0.07–30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		**No Federal Standards**		
Sulfates	24-Hour	25 μg/m^3	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 μg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[8]	24-Hour	0.01 ppm (26 μg/m^3)	Gas Chromatography			

Source: California Air Resources Board (ARB), November 17, 2008.

See footnotes on next page.

Footnotes:

[1] California standards for ozone; carbon monoxide (except Lake Tahoe); sulfur dioxide (1- and 24-hour); nitrogen dioxide; suspended particulate matter, PM_{10}; and visibility-reducing particles are values not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[2] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth-highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 mg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

[3] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] Any equivalent procedure that can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

[5] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[6] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[7] Reference method as described by the EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the EPA.

[8] The ARB has identified lead and vinyl chloride as “toxic air contaminants” with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[9] National lead standard, rolling 3-month average: final rule signed October 15, 2008.

EPA = United States Environmental Protection Agency
mg/m^3 = milligrams per cubic meter
ppm = parts per million
μg/m^3 = micrograms per cubic meter

Table 2.2.6-3 Attainment Status of Criteria Pollutants in the South Coast Air Basin

Pollutant	State	Federal
O_3 1-hour	Nonattainment	Revoked June 2005
O_3 8-hour	Nonattainment	Severe 17 Nonattainment
PM_{10}	Nonattainment	Serious Nonattainment[1]
$PM_{2.5}$	Nonattainment	Nonattainment[2]
CO	Attainment	Attainment/Maintenance[3]
NO_2	Attainment	Attainment/Maintenance
All others	Attainment/Unclassified	Attainment/Unclassified

Source: California Air Resources Board (ARB), 2008 (http://www.arb.ca.gov/desig/desig.htm).
1 In October 2006, the EPA, in its final rule revision, eliminated the annual PM_{10} standard.
2 The $PM_{2.5}$ nonattainment designation is based on the 1997 standard. In 2006, the EPA revised the 24-hour standard. The 2006 $PM_{2.5}$ new standard of 35 $\mu g/m^3$ applies 1 year after the effective date of the new designation (December 2010).
3 Effective June 11, 2007, the South Coast Air Basin was redesignated as attainment/ maintenance for the federal CO standard.
CO = carbon monoxide
EPA = United States Environmental Protection Agency
NO_2 = nitrogen dioxide
O_3 = ozone
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
$\mu g/m^3$ = micrograms per cubic meter

2.2.6.3 Environmental Consequences

Temporary Impacts

No Build Alternative

The No Build Alternative would not result in the construction of any of the proposed improvements to SR-74 and therefore would not result in short-term impacts to air quality.

Build Alternatives 1 and 2

During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment also are anticipated and would include CO, nitrogen oxides (NOx), volatile organic compounds (VOCs), directly emitted particulate matter (PM_{10} and $PM_{2.5}$), and toxic air contaminants such as diesel exhaust particulate matter. Ozone is a regional pollutant that is derived from NOx and VOCs in the presence of sunlight and heat.

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, removing or improving existing roadways, and paving roadway surfaces. Construction-related effects on air quality from most highway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. If not properly controlled, these activities would temporarily generate PM_{10}, $PM_{2.5}$, and small amounts of CO, SO_2, NOx, and VOCs. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Construction activities for large development projects are estimated by the EPA to add 1.2 tons of fugitive dust per acre of soil disturbed per month of activity. If water or other soil stabilizers are used to control dust, the emissions can be reduced by up to 50 percent. The Department's Standard Specifications (Section 10) pertaining to dust minimization requirements requires use of water or dust palliative compounds and will reduce potential fugitive dust emissions during construction.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_X, VOCs, and some soot particulate (PM_{10} and $PM_{2.5}$) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

SO_2 is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Off-road diesel fuel meeting federal standards can contain up to 5,000 parts per million (ppm) of sulfur, whereas on-road diesel is restricted to less than 15 ppm of sulfur. However, under California law and ARB regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel, so SO_2-related issues due to diesel exhaust will be minimal. Some phases of construction, particularly asphalt paving, would result in short-term odors in the immediate area of each paving site. Such odors would be quickly dispersed below detectable thresholds as distance from the site increases.

Permanent Impacts

No Build Alternative

Under the No Build Alternative, traffic congestion would continue to increase, LOS operations of nearby roadways and intersections would deteriorate, and traffic congestion would worsen. Long-term mobile emissions generated by vehicle trips would be greater under the No Build Alternative due to reduced traffic flow in the project area. Additionally, the No Build Alternative would not facilitate the air quality attainment goals of the Air Quality Management Plan (AQMP) and Regional Management Plan (RMP), as it does not implement proposed roadway improvements that would reduce congestion and improve air quality emissions. Since the No Build Alternative would not improve air quality through a reduction in congestion, its air quality impacts are considered potentially significant.

Build Alternatives 1 and 2

Long-term Vehicle Emissions Impact

The purpose of the proposed project is to alleviate existing and future traffic congestion along SR-74 during peak hours. The proposed project would not generate new vehicular traffic trips since it would not construct new homes or businesses. However, there is a possibility that some traffic currently utilizing other routes would be attracted to use the improved facility, thus resulting in slight increases in vehicle miles traveled (VMT). Therefore, the potential impact of the proposed roadway widening project on regional vehicle emissions was calculated using traffic data for the SCAG region and emission rates from the EMFAC2007 emission model.

A supplemental traffic analysis prepared by Austin-Foust Associates, Inc. (July 2008) estimated the impact that the proposed project would have on regional VMT and regional vehicle hours traveled (VHT). As shown in Table 2.2.6-4, the proposed project would result in an increase in VMT and VHT in 2013 and 2035.

Table 2.2.6-4 Change in Regional VMT and VHT

Year	Regional VMT	Regional VHT
2013 Increase	1,430	240
2008 Regional Baseline	260,476,434	6,373,801
2035 Increase	4,297	714
2035 Regional No Build	344,523,122	10,453,545
2035 Regional Build	344,527,419	10,454,259

Source: Austin-Foust Associates, Inc., July 2008.
VMT = vehicle miles traveled
VHT = vehicle hours traveled

The VMT and VHT data listed in Table 2.2.6-4, along with the EMFAC2007 emission rates, were used to calculate the CO, ROG, NO_X, SO_X, PM_{10}, and $PM_{2.5}$ emissions for the 2035 regional conditions. The results of the modeling are listed in Table 2.2.6-5. As shown in Table 2.2.6-5, for both the 2035 Build and 2035 No Build conditions, the CO, ROG, and NO_X emissions would decrease by 66 to 74 percent when compared to existing conditions. In addition, although the regional SO_X, PM_{10}, and $PM_{2.5}$ would increase by 12 to 46 percent between 2008 and 2035 for both the 2035 No Build and 2035 Build conditions, the proposed project would contribute less than 1 lb/day (less than 0.03 percent). The majority of the increase in SO_X, PM_{10}, and $PM_{2.5}$ emissions are the result of factors beyond the project, such as regional growth. The 0.03 percent increase is minute and within the error rate of the model. Because, the 1 to 24 lb/day project-related increase in SO_X, PM_{10}, and $PM_{2.5}$ would not result in a substantial change to the regional pollutant concentrations and because CO, ROG and NO_X emissions are expected to decrease substantially, the project's permanent air quality impacts are deemed to be less than significant.

Table 2.2.6-5 Change in Regional Vehicle Emissions (lbs/day)

Pollutant	2008 Baseline Emissions	2035 No Build Emissions	2035 With Project Emissions	Project-Related Increase from Baseline	Project-Related Increase from No Build
CO	1,842,775	626,518	626,542	-1,216,233 (-66%)	24 (+0.004%)
ROG	94,177	30,413	30,415	-63,762 (-68%)	2 (+0.007%)
NO_X	554,728	146,654	146,659	-408,069 (-74%)	5 (+0.004%)
SO_X	2,297	3,348	3,349	1,052 (+46%)	1 (+0.03%)
PM_{10}	27,564	32,072	32,073	4,509 (+16%)	1 (+0.003%)
$PM_{2.5}$	17,802	19,919	19,920	2,118 (+12%)	1 (+0.005%)

Source: LSA Associates, Inc., November 2009.
CO = carbon monoxide
lbs = pounds
NO_x = nitrogen oxide
O_3 = ozone
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
PM_{10} = particulate matter less than 10 microns, but greater than 2.5 microns in diameter
ROG = reactive organic gases
SO_x = sulfur oxide

CO Hot Spot Analysis

The Department document, *Transportation Project-Level Carbon Monoxide Protocol* (1997) (Protocol) was used to determine whether a CO hot spot analysis would be required. The Protocol provides two conformity requirement decision flowcharts that are designed to assist the project sponsors in evaluating the requirements that apply to specific projects. The area affected by the project is expected to experience a much lower CO concentration than the worst-case intersection in the 2007 AQMP. Results of the CO qualitative analysis in the *Air Quality Analysis* concluded that the project would not result in any CO hot spots and would not exacerbate existing hot spots. Therefore, potential CO impacts of the Build Alternatives are considered less than significant.

Qualitative Project-Level Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are federal AAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, nonroad mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS)[1]. In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA)[2]. These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter (POM). While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (vehicle-miles travelled, VMT) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in Table 2.2.6-6. The projected reduction in MSAT emissions

---

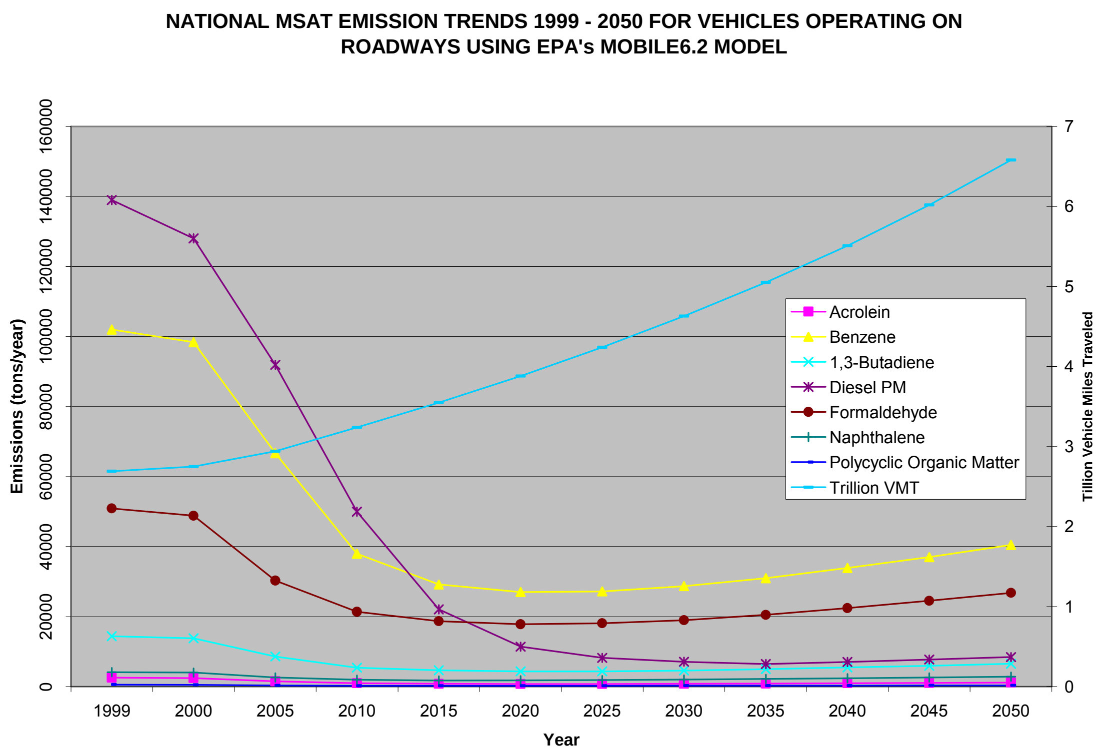
[1] http://www.epa.gov/ncea/iris/index.html

[2] http://www.epa.gov/ttn/atw/nata1999/

would be slightly different in California due to the use of the EMFAC2007 emission model in place of the MOBILE6.2 model.

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the

Table 2.2.6-6 National MSAT Emission Trends



ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of the National Environmental Policy Act (NEPA).

In September 2009, the FHWA issued guidance[1] to advise FHWA division offices as to when and how to analyze MSATs in the NEPA process for highways. This document is an update to the previous guidance released in February 2006. The guidance is described as interim because MSAT science is still evolving. As the

---

1 http://www.fhwa.dot.gov/environment/airtoxic/100109guidmem.htm.

science progresses, FHWA will update the guidance. This analysis follows the FHWA guidance.

Information that is Unavailable or Incomplete

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects"[1]. Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations[2] or in the future as vehicle emissions substantially decrease[3].

---

[1] EPA, http://www.epa.gov/ncea/iris/index.html

[2] HEI, http://pubs.healtheffects.org/view.php?id=282

[3] HEI, http://pubs.healtheffects.org/view.php?id=306

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable. The results produced by the EPA's MOBILE6.2 model, the California EPA's Emfac2007 model, and the EPA's DraftMOVES2009 model in forecasting MSAT emissions are highly inconsistent. Indications from the development of the MOVES model are that MOBILE6.2 significantly underestimates diesel particulate matter (PM) emissions and significantly overestimates benzene emissions.

Regarding air dispersion modeling, an extensive evaluation of EPA's guideline CAL3QHC model was conducted in an NCHRP study[1], which documents poor model performance at ten sites across the country – three where intensive monitoring was conducted plus an additional seven with less intensive monitoring. The study indicates a bias of the CAL3QHC model to overestimate concentrations near highly congested intersections and underestimate concentrations near uncongested intersections. The consequence of this is a tendency to overstate the air quality benefits of mitigating congestion at intersections. Such poor model performance is less difficult to manage for demonstrating compliance with National Ambient Air Quality Standards for relatively short time frames than it is for forecasting individual exposure over an entire lifetime, especially given that some information needed for estimating 70-year lifetime exposure is unavailable. It is particularly difficult to reliably forecast MSAT exposure near roadways, and to determine the portion of time that people are actually exposed at a specific location.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI[2]. As a result, there is no national consensus on air dose-response

1 EPA, http://www.epa.gov/scram001/dispersion_alt.htm#hyroad

2 http://pubs.healtheffects.org/view.php?id=282

values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA[1] and the HEI[2] have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Qualitative Project Level MSAT Analysis

For each project alternative, the amount of MSATs emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each alternative. The proposed project is a road widening project that increases the

---

1 http://www.epa.gov/risk/basicinformation.htm#g

2 http://pubs.healtheffects.org/getfile.php?u=395

capacity of SR-74. This type of project improves road operations by reducing traffic congestion and improving traffic operations. The proposed project would reduce the delay and improve the LOS compared to without the project.

In the future, emissions for the No Build and Build Alternatives are projected to be lower than present levels in the design year as a result of the EPA's national control programs, which are projected to reduce MSAT emissions by 72 percent between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future than they are today.

In summary, under both Build Alternatives, it is expected that there would be similar or lower MSAT emissions in the study area relative to the No Build Alternative due to the improvement of the LOS. On a regional basis, the EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time result in substantial reductions that, in almost all cases, will cause regionwide MSAT levels to be substantially lower than they are today. Permanent impacts to regional and local air quality as a result of Alternatives 1 and 2 are not considered adverse.

Greenhouse Gas Emissions

Because there have been more requirements set forth in California legislation and executive orders regarding climate change, the issue is addressed in the CEQA chapter of this environmental document. The four strategies set forth by FHWA to lessen climate change impacts do correlate with efforts that the State has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours travelled.

2.2.6.4 Avoidance, Minimization, and/or Mitigation Measures

Most of the construction impacts to air quality are short term in duration and, therefore, will not result in adverse or long-term conditions. Implementation of the following measures will reduce air quality impacts resulting from construction activities:

- The construction contractor shall comply with the Department's Standard Specifications Section 7-1.01F and Section 10 of the Department's Standard Specifications (1999).

- Section 7, "Legal Relations and Responsibility," addresses the contractor's responsibility on many items of concern, such as: air pollution; protection of lakes, streams, reservoirs, and other water bodies; use of pesticides; safety; sanitation; convenience of the public; and damage or injury to any person or property as a result of any construction operation. Section 7-1.01F specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.
- Section 10 is directed at controlling dust. If dust palliative materials other than water are to be used, material specifications are contained in Section 18.

- Apply water or dust palliative to the site and equipment as frequently as necessary to control fugitive dust emissions.
- Spread soil binder on any unpaved roads used for construction purposes and on all project construction parking areas.
- Wash off trucks as they leave the right-of-way as necessary to control fugitive dust emissions.
- Properly tune and maintain construction equipment and vehicles. Use low-sulfur fuel in all construction equipment as provided in California Code of Regulations Title 17, Section 93114.
- Develop a dust control plan documenting sprinkling, temporary paving, speed limits, and expedited revegetation of disturbed slopes as needed to minimize construction impacts to existing communities.
- Locate equipment and materials storage sites as far away from residential and park uses as practical. Keep construction areas clean and orderly.
- Establish ESAs for sensitive air receptors within which construction activities involving extended idling of diesel equipment would be prohibited to the extent feasible.
- Use track-out reduction measures such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic.
- Cover all transported loads of soils and wet materials prior to transport, or provide adequate freeboard (space from the top of the material to the top of the truck) to reduce PM_{10} and deposition of particulate matter during transportation.
- Remove dust and mud that are deposited on paved public roads due to construction activity and traffic to decrease particulate matter.
- Route and schedule construction traffic to avoid peak travel times as much as possible in order to reduce congestion and related air quality impacts caused by idling vehicles along local roads.

- Install mulch or plant vegetation as soon as practical after grading to reduce windblown particulate in the area.

Additionally, the SCAQMD has established Rule 403 for reducing fugitive dust emissions (PM_{10}). The Best Available Control Measures (BACM), as specified in SCAQMD Rule 403, shall be incorporated into the project commitments. With the implementation of standard construction measures (providing 50 percent effectiveness) such as frequent watering (e.g., minimum twice per day), fugitive dust emissions from construction activities are considered less than significant.

The project is located in Orange County, which is not among the counties listed as containing serpentine and ultramafic rock. Therefore, there would be no impacts from Naturally Occurring Asbestos during project construction.

2.2.6.5 Level of Significance

The No Build Alternative would result in no temporary air quality impacts but would result in potentially significant permanent air quality impacts.

Permanent, temporary, direct, and indirect air quality impacts of the Build Alternatives are considered less than significant.